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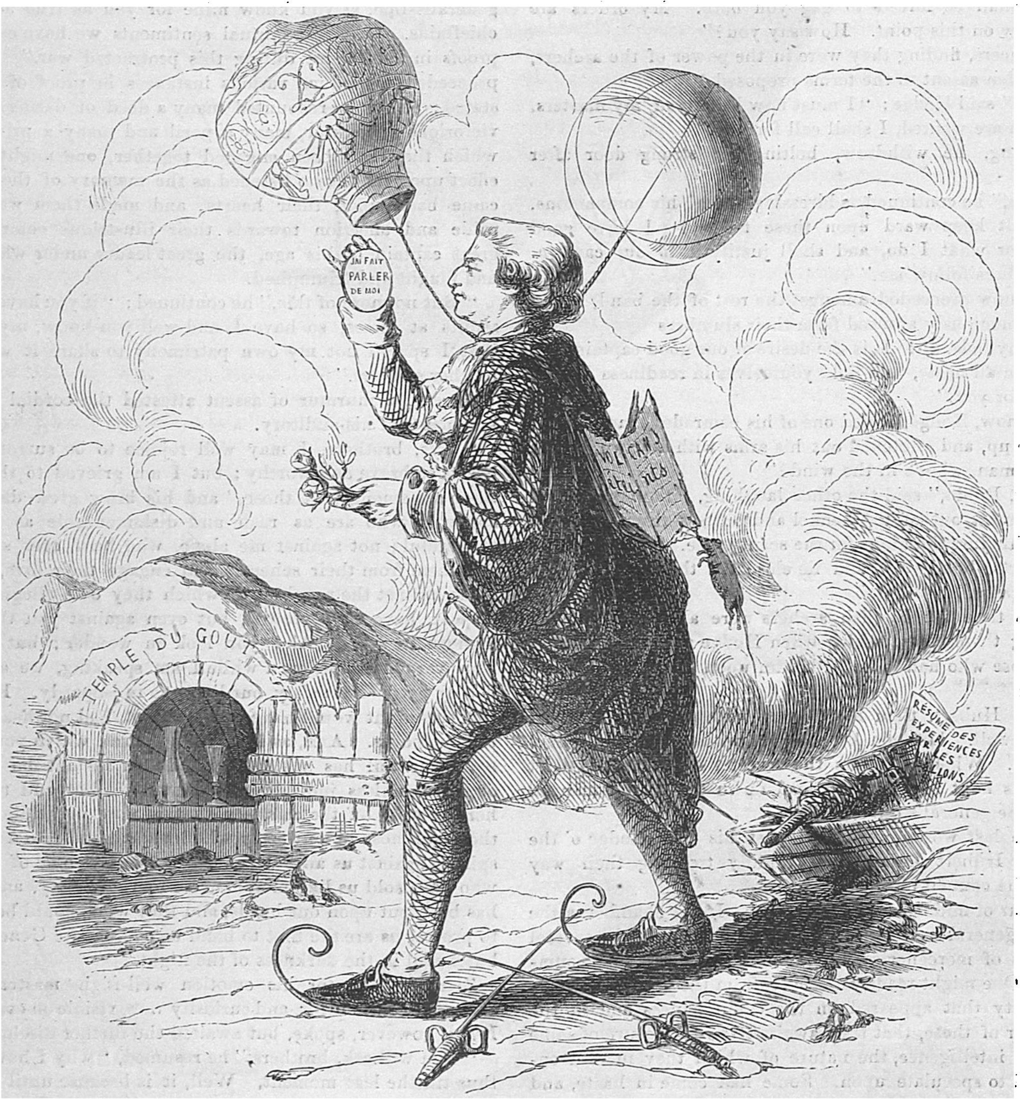
AIR BALLOONS.

The accompanying engraving is a specimen of the numerous caricatures which were brought forth by the invention of air balloons, like so many insects fluttering in a sunbeam.

The satirical drawing of the *Volomanist* was most probably aimed at Faujas de Saint-Fond, a young geologist, the friend and *protégé* of Buffon, whose gigantic theories, his observations on the formation of the earth, and his researches respecting extinct volcanoes, he supported. When an official report, signed by the deputies of the state of Vivarais, together with various private letters, arrived to inform the Parisians and the members of the Academy, for the most part men who did not easily imbibe new ideas, that two young manufacturers had launched into the air, at Annonay, a globe of considerable size, which sustained itself and sailed through space, there was a general burst of enthusiasm before envious feelings had had time to display themselves. M. Faujas was among the most ardent admirers of the new discovery, and in order that the experiment might be repeated at Paris, instituted a national subscription, to which the people entered their names at the Café du Caveau, now the Rotonde.

Etienne Mongolfier gave an account of his ascent at Annonay, which was expressed with a moderation seldom met with in that age of exaggeration and hyperbole. The scrupulous exactness of the details which it contained enabled M. Charles, professor of experimental philosophy, and the Messrs. Robert, skilful machine-makers, to satisfy, in the space of a month, the expectations of the subscribers, and to dispense with the presence of the inventors whilst making use of their discovery. However, one of the Messrs. Mongolfier arrived in Paris in time to see that he had enabled his fellow-townspeople to make the experiment without his help.

The words in which he describes his ascent, and the means which he employed to effect it, are very striking, from their extreme simplicity and clearness. He says:—


ON FAIT PARLER DE MOI
VOLCANS éteints
TEMPLE DU GOUT
RESUME DES EXPERIENCES SUR LES BALLONS

THE VOLOMANIST.—A CARICATURE OF THE EIGHTEENTH CENTURY.

"The aerostatic machine (p. 165)* with which the experiment was made before the gentlemen of the state of Vivarais, on Thursday, 5th June, 1783, was made of linen, lined with paper, sewn to a network of twine. Its form was nearly spherical,

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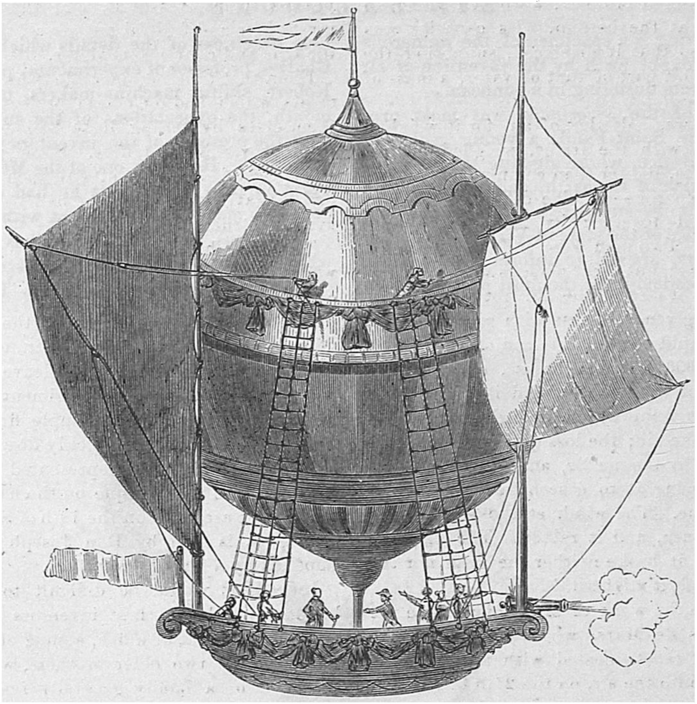
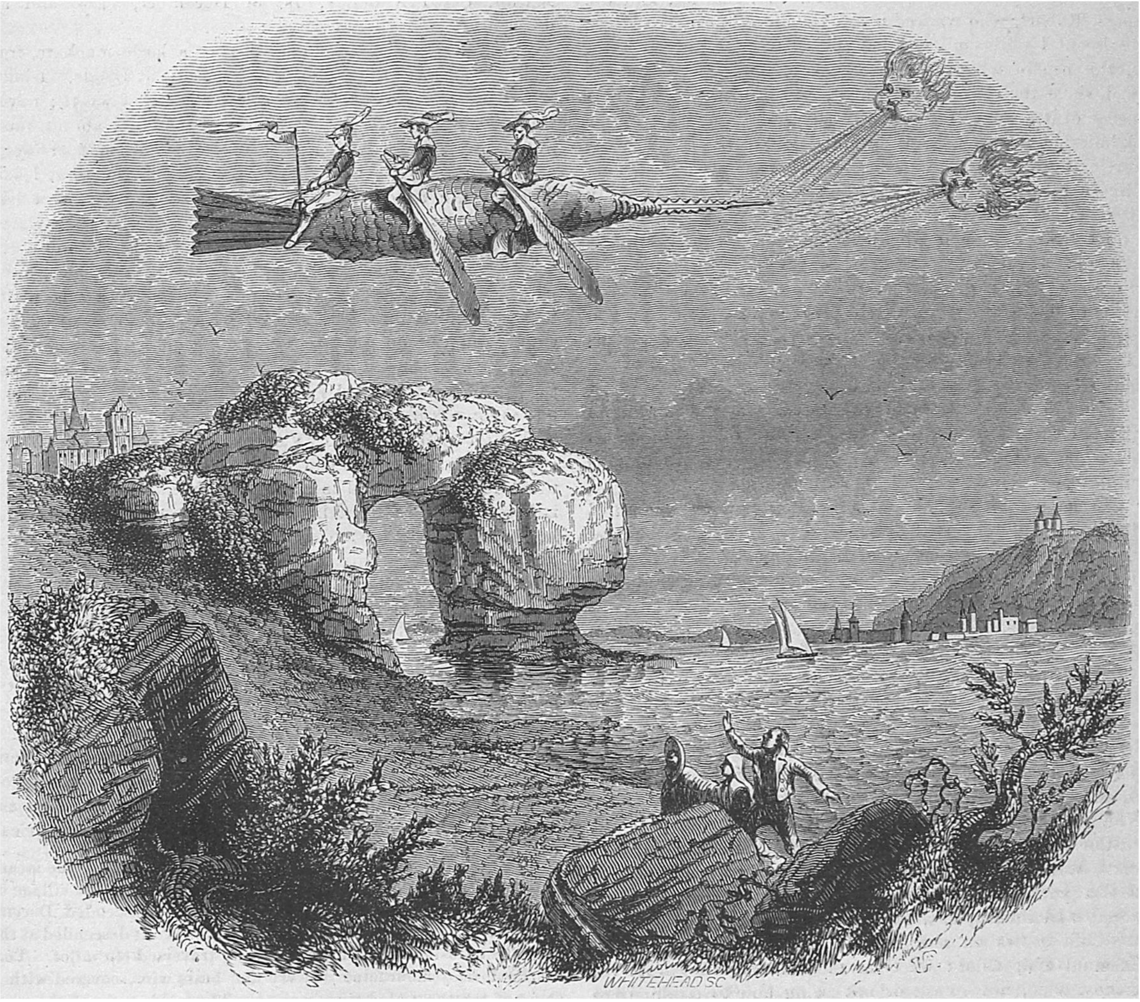
* The first experiment of the aerostatic machine, with the means of directing it at will, by Dr. Jonathan, took place at the village of Dessessebrugue, in France, whence this machine ascended, December 22nd, 1783, at nine o'clock in the morning. It descended at the place whence it had risen, after having traversed ten miles. This machine was constructed of very fine brass wire, covered with a sheet of cotton, coated with cement. The rudder was of the same material, and the sail of common canvas.



AEROSTATIC MACHINE.


WHITEHEAD SC.

AEROSTATIC FISH.

and its circumference measured 110 feet; a wooden frame, 16 feet square, held it fast at the bottom. Its capacity was about 22,000 cubic feet, so that it displaced, supposing the weight of air to be an 800th part of that of water, a mass of air weighing 1,980lbs.

"The weight of the gas was half that of air, for it weighed 990lbs., and the machine, with the frame, weighed 500lbs. Therefore, it was still 490lbs. lighter than common air, which has been proved by the experiment. The different pieces of the machine were fastened together by means of simple buttons and button-holes. Two men were sufficient to set it off, and to fill it with the gas; but eight persons were required for the purpose of holding it down, who did not release their hold until the signal was given. It rose with great velocity, its motion becoming less rapid towards the end of the ascent, to about the height of 6,300 feet. A breeze, scarcely perceptible upon the surface of the earth, carried it a distance of 76,000 feet from the place from which it had started. It remained ten minutes in the air; the loss of gas through the button and the holes made by the needle, and other imperfections in the machine, causing it to descend sooner than it would otherwise have done. The wind, at the time of the experiment, was in the south, and it rained. The machine descended so lightly, that it broke neither the stem nor the props of the vine upon which it alighted."

This account is quoted in the work of M. Faujas, upon the experiment of the Champs de Mars, where a globe, twelve feet in diameter, made of taffeta coated with india-rubber, was inflated and launched into the air, on the 27th of August, 1783, by means of the constant labour of many workmen for the space of four days, and by employing 1,000lbs. of steel filings, and 498lbs. of sulphuric acid. M. Charles, and the Messrs. Robert, who worked under the direction of the above experimental philosopher, filled their balloon with hydrogen gas, the use of which the brothers Mongolfier had abandoned since their first experiment, because they found the expense of it too great.

Admission to the Champs de Mars, where the public were diverting themselves with his discovery, was refused to Etienne Mongolfier; he gave his name, and being repulsed, quietly retired. Faujas considered himself personally insulted by this conduct towards one of the inventors, whose genius he so much admired, and in honour of whom he had set the subscription on foot; displeased, moreover, with the Roberts, who had filled the balloon in such a manner as to cause it to explode, he complained loudly, and a virulent paper warfare was soon declared between the subscribers—M. Faujas at the head—and the philosophers and machine-makers employed by them. The caricature of the *Volomanist* was doubtless connected with this contest. Grimm, who relates in detail the literary and scientific events of the time, mentions this conflict more than once in his correspondence.

"We have had the honour of giving you an account," writes he, "of the pretensions of M. Charles, the experimental philosopher, to the discovery of M. Mongolfier. Whilst the latter was occupied in perfecting his machine, ascending to the height of more than 300 feet in the air, M. Charles sought out pamphleteers, and, in his circumstances, could only find the Chevalier de Rivarol. This writer interested himself less in maintaining the pretensions of his client than in seeking to lessen, as much as possible, the fame of M. Mongolfier, and to bring into ridicule M. Faujas de Saint-Fond, who was zealously engaged in forwarding the principles and repeating the experiments of the Messrs. Mongolfier, by raising a subscription, and having a medal struck in their honour."

Now the question was, who should derive profit or glory from the discovery made by the two quiet, retiring philosophers. What then took place recalls the allegory of the East, where a young prince, by dint of labour, perseverance, courage, and intelligence, succeeds in reaching the precious nut which grows on the highest branch of the tree of science. He opens it: all sorts of wonders burst from it; but those who, not daring or not being able to climb, have stopped at the foot of the tree, dart in crowds upon this booty, possess themselves of it, and the two empty shells of the mysterious and fruitful nut are all that remain in the hands of the true and courageous victor.

From that time innumerable pamphlets announced experiments which had only been projected. Tradesmen enriched themselves by selling little balloons, made of gold-beaters' skin, or varnished taffeta. Some printed their hypotheses, and pretended means of guidance; others, like Blanchard, had engravings executed of balloons, which were not always even constructed.

Thus the balloon of Dr. Jonathan, with the explanations which accompany it, probably only existed upon paper. The cannon represented in front of the gondola was never discharged, either to announce the arrival or the departure of an aeronaut, and never accelerated the course of a balloon, for none was ever made fit to cleave the air. The only trace which we find of the experiment of Dr. Jonathan is the notice of the ascent of a simple fire-balloon on the 24th of December, 1783, which quickly disappeared.

The aerostatic fish[*], represented in our engraving (p. 165), appears to be a burlesque on the balloon, in the shape of a fish, which ascended on the 19th of September, 1784, in Spain, guided, it is said, by Don Joseph Patinha, and which was impelled by a favourable breeze.

Indeed, it would be difficult to conceive any form for balloons which the first inventors had not taken into consideration. That of a fish, among others, was foremost in the minds of the two elder brothers, who were the most highly endowed of a family generally remarkable for intelligence. We will quote, on this subject, some passages from a letter of the canon Mongolfier, the old president of the college of Autun, dated Annonay, 1st of December, 1783, and addressed to his brother, Etienne:—

"You know that Joseph is having a large machine, from eighty to a hundred feet in diameter, made at Lyons. I joked him about it the other day in a letter which I wrote; nevertheless, this idea runs in my head, and though I am not much of a philosopher, I think I may be allowed to consider myself at least equal to Joseph, since he has written me that I have given him a new idea. Now, having sung my own praises, *revenons à nos moutons.*

"It is not exactly the form of a sheep which I should give to your machine, nor should I, like your pamphleteer, advocate that of the horse, Pegasus; but it is that of a fish, with a tail, broad, but not thick, covered with whalebone or cane to supply the place of sinews, to move this immense helm, which should be filled with inflammable air. The wings, or rather the fins of the fish, of the same material, should be of taffeta, but as long as possible, and always filled with gas, in order to be lighter than the same volume of atmospheric air—in fact, any alterations which you may consider advisable. But as the Author of Nature has given to each individual that which is best adapted to fulfil his destiny, follow the models which he places before you; and since your object is to sail through a fluid, imitate the animal which traverses a fluid with the greatest ease. You will say, perhaps, 'Why not imitate the bird?' But it is specifically heavier than the air. Your machine, being lighter, bears more resemblance to the fish, which is lighter, or at least as light as the same volume of water. The bird's excess of weight is counteracted by the great extent of its wings, compared with the size of its body, and the multiplicity and vigour of its movements. The fins of the fish would be much more economical, much easier to put in motion, and would suffice for your experiment.

"However, as we must give justice to whom it is due, the first idea was Jean Pierre's; the arguments are mine. You will tell me, perhaps, that neither the one nor the other is common sense; as I know the difficulty of a lawsuit, I will submit to the sentence, though I could dispute it, considering that to judge is not to prove," etc.

[*] The aerostatic fish was set off at Plazentia, a town of Spain, surrounded by mountains. It was guided by Don Joseph Patinha as far as the town of Coria, on the banks of the river Aragon, at twelve miles' distance from Plazentia, March 10th, 1784.